

**CLAIMS**

1. Packaging including an oxygen-scavenging element including an activatable semiconductor which, when activated, acts to scavenge oxygen from its surrounding environment.
2. The packaging of claim 1, wherein the oxygen-scavenging element includes a sacrificial electron donor.
3. The packaging of claim 2, wherein the sacrificial electron donor comprises an organic material.
4. The packaging of claim 3, wherein the organic material comprises a polymeric material.
5. The packaging of claim 4, wherein the polymeric material comprises PVA, PVC, PEG, polyethylene oxide, hydroxyethyl cellulose, or a mixture thereof.
6. The packaging of claim 3, wherein the organic material comprises an amine.
7. The packaging of claim 6, wherein the amine comprises EDTA, triethylamine, or a mixture thereof.
8. The packaging of claim 3, wherein the organic material comprises an alcohol.
9. The packaging of claim 3, wherein the organic material comprises a thiol.
10. The packaging of claim 3, wherein the organic material comprises an aldehyde.
11. The packaging of any of claims 2 to 10, wherein the sacrificial electron donor comprises a liquid.

12. The packaging of any of claims 2 to 10, wherein the sacrificial electron donor comprises a solid.
13. The packaging of any of claims 2 to 10, wherein the sacrificial electron donor  
5 comprises a gas.
14. The packaging of any of claims 2 to 10, wherein the sacrificial electron donor comprises a vapor.
- 10 15. The packaging of any of claims 1 to 14, wherein the activatable semiconductor comprises an oxide semiconductor.
16. The packaging of claim 15, wherein the semiconductor comprises  $\text{TiO}_2$ .
- 15 17. The packaging of claim 15, wherein the semiconductor comprises  $\text{ZnO}$ .
18. The packaging of claim 15, wherein the semiconductor comprises  $\text{WO}_3$ .
19. The packaging of claim 15, wherein the semiconductor comprises at least two of  
20  $\text{TiO}_2$ ,  $\text{ZnO}$  and  $\text{WO}_3$ .
20. The packaging of any of claims 1 to 19, wherein the oxygen-scavenging element comprises a suspension containing an activatable semiconductor.
- 25 21. The packaging of any of claims 1 to 19, wherein the oxygen-scavenging element comprises a paste containing an activatable semiconductor.
22. The packaging of any of claims 1 to 19, wherein the oxygen-scavenging element comprises a gel containing an activatable semiconductor.
- 30 23. The packaging of any of claims 1 to 19, wherein the oxygen-scavenging element comprises a solid containing an activatable semiconductor.

24. The packaging of claim 23, wherein the oxygen-scavenging element comprises a block containing an activatable semiconductor.
- 5 25. The packaging of claim 23, wherein the oxygen-scavenging element comprises a layer containing an activatable semiconductor.
26. The packaging of claim 23, wherein the oxygen-scavenging element comprises a powder containing an activatable semiconductor.
- 10 27. The packaging of any of claims 1 to 26, wherein the activatable semiconductor comprises a photo-activatable semiconductor.
- 15 28. The packaging of claim 27, wherein the photo-activatable semiconductor is activatable by ultra-bandgap light.
29. The packaging of any of claims 1 to 28, wherein the activatable semiconductor comprises an electro-activatable semiconductor.
- 20 30. The packaging of claim 29, wherein the electro-activatable semiconductor is activatable by application of an electrical bias.
31. A package packaging an item and including the packaging of any of claims 1 to 30.
- 25 32. The package of claim 31, wherein the package defines a closed environment in which the item is enclosed.
- 30 33. The package of claim 31 or 32, wherein the oxygen-scavenging element comprises an encapsulating layer encapsulating at least a surface of the item.

34. The package of claim 31 or 32, wherein the packaging comprises a film packaging defined at least in part by the oxygen-scavenging element.

5 35. The package of claim 31 or 32, wherein the packaging includes an open-topped container and the oxygen-scavenging element comprises a film which closes the container.

10 36. The package of claim 31 or 32, wherein the packaging includes a closed container and the oxygen-scavenging element is disposed within the container.

37. The package of any of claims 31 to 36, wherein the item comprises an electronic device.

15 38. The package of any of claims 31 to 36, wherein the item comprises an opto-electronic device.

39. The package of claim 37 or 38, wherein the item comprises a molecular device.

20 40. The package of claim 37 or 38, wherein the item comprises a polymeric device.

41. The package of any of claims 31 to 36, wherein the item comprises a foodstuff.

25 42. Use of an oxygen-scavenging element including an activatable semiconductor in packaging to scavenge oxygen from its surrounding environment when activated.